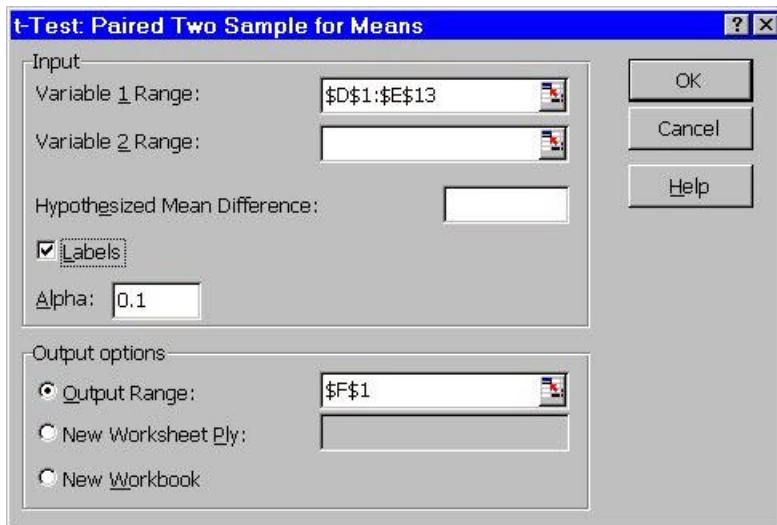**INTEGRATED TRAINING AREA MANAGEMENT**
ITAM Learning Module
Helpful Note

Using the t-Test: Paired Two Sample for Means in Microsoft Excel

The procedures discussed here are specific to Microsoft Excel 97 (version 8.0) but are similar in earlier versions of Excel.

Select **Tools** from the main menu then **Data Analysis**. If the Data Analysis option is not found, search the Excel help for "add-in programs, Analysis ToolPak" for installation instructions. A series of Analysis Tools are displayed. This information explains the t-Test: Paired Two Samples for Mean tool.

Input Range: First, left click on the Variable 1 Range field. Using your cursor, highlight all of the data to include for the first variable. Follow the same procedure for variable 2. If column headers are present include them in the selection and place a check in the Labels option. When labels are present they are used in the summary table. If labels are not available the summary table will contain Variable 1 and Variable 2 as variable names.

Alpha: Enter the desired Alpha value. The results will show values for both one-tailed and two-tailed tests.

Output Range: Click an empty cell in a worksheet. If the results will overlap existing information a warning will appear, select another cell. Alternatively, you may decide to output the results to a new worksheet or workbook.

Results: The mean and variance for each variable is reported. The Pearson Correlation, Hypothesized Mean Difference, degrees of freedom (df) and the t statistic is reported for the test. The probability and critical values for one-tailed and two-tailed distributions are also shown.

The pooled variance is not shown in the output but can be easily calculated from the given results. Below is the equation for a pooled variance.

$$S^2 = \frac{n_1 S_1^2 + n_2 S_2^2}{n_1 + n_2 - 2}$$

where
   S^2 = variance of the differences between measurements
   n_1 = number of observations for first year
   n_2 = number of observations for second year
   S^2_1 = variance of first year data (from the paired t-test)
   S^2_2 = variance of second year data (from the paired t-test)